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NORTHWESTERN UNIVERSITY

CHICAGO—EVANSTON

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QUARTERLY BULLETIN

OF THE

DENTAL SCHOOL

OFFICE OF PUBLICATION
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NORTHWESTERN UNIVERSITY

EVANSTON-CHICAGO.

The University comprises the following departments of instruction, each having a distinct faculty:

The College of Liberal Arts, in Evanston,
Founded in 1851; opened in 1855.
The Medical School, in Chicago,
Founded in 1859.
The Law School, in Chicago,
Founded in 1859.
The School of Pharmacy, in Chicago,
Founded in 1886.
The Dental School, in Chicago,
Founded in 1887.
The School of Music, in Evanston,
Organized in 1895.

The following non-degree-conferring departments are maintained by the University:

The Academy at Evanston,
Founded in 1851; opened in 1855.
Grand Prairie Seminary, at Onargo, Ill.,
Founded in 1863.
The Elgin Academy, at Elgin, Ill.,
Chartered in 1839; opened in 1856.

Garrett Biblical Institute, a theological school authorized by its charter to confer degrees in divinity, established on its own foundation and under separate management. The buildings of the Institute are on the University Campus, in Evanston, and the school is in close coöperation with the University.

The Norwegian-Danish Theological School in Evanston is affiliated with the Institute.

The Swedish Theological Seminary is an independent school located on the University Campus in Evanston.

The Cumnock School of Oratory is conducted on the University Campus, in Evanston.

The Interstate School of Correspondence in Chicago is affiliated with the University, its certificates in academic courses being accepted at their face value toward meeting the entrance requirements in any department.

NORTHWESTERN UNIVERSITY

President, Abram Winegardner Harris., L.L.D.

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CALENDAR

1907	
October 1-12	Examination of credentials for admission.
October 1	School opens.
October 3-12	Examinatons for advanced standing.
November 28	Thanksgiving.
December 21	Last day of school before Christmas.
1908	
January 6	First day of school after Christmas vacation.
January 14	Alumni Clinic.
January 29	Mid-term examinations begin.
February 6	First Semester and mid-term examinations end.
February 7	Second Semester begins.
February 22	Washington's Birthday.
May 14	Senior examinations begin.
May 21	Junior and Freshman examinations begin.
May 28	Commencement.
June 1	Practitioners' summer course begins.
June 27	Last day of practitioners' course.

NORTHWESTERN UNIVERSITY DENTAL SCHOOL

FACULTY.

1906-7.

ABRAM WINEGARDNER HARRIS, Sc. D., LL. D., *President of the University.*

GREENE VARDIMAN BLACK, M.D., D.D.S., Sc.D., LL.D., *Dean, Professor of Operative Dentistry, Pathology and Bacteriology.*

THOMAS LEWIS GILMER, M.D., D.D.S., *Professor of Oral Surgery.*

ELGIN MAWHINNEY, D.D.S., *Professor of Special Pathology, Materia Medica and Therapeutics.*

EDMUND NOYES, D.D.S., *Professor of Dental Jurisprudence and Ethics.*

JAMES HARRISON PROTHERO, D.D.S., *Professor of Prosthetic Technics, Prosthetic Dentistry and Metallography.*

FREDERICK BOGUE NOYES, A.B., D.D.S., *Professor of Histology.*

TWING BROOKS WIGGIN, M.D., *Professor of Physiology and Pathology.*

VERNON JAMES HALL, PH.D., *Professor of Chemistry*

GEORGE AMOS DORSEY, PH.D., *Professor of Comparative Anatomy.*

CHARLES LEWIS MIX, A.M., M.D., *Professor of Anatomy.*

IRA BENSON SELLERY, D.D.S., *Professor of Orthodontia.*

ARTHUR DAVENPORT BLACK, B.S. M.D., D.D.S., *Assistant Professor of Operative Dentistry and Assistant in Oral Surgery.*

EUGENE SHAW WILLARD, D.D.S., *Assistant Professor of Operative Dentistry and Bacteriology.*

FRED WILLIAM GETHRO, D.D.S., *Assistant Professor of Operative Dentistry and Dental Anatomy.*

HARRY ISAAC VAN TUYL, B.S., M.D., D.D.S., *Assistant Professor of Anatomy.*

HERMAN DURAND PETERSON, M.D., *Lecturer on Anæsthesia and Assistant in Oral Surgery.*

CHARLES RUDOLPH EDWARD KOCH, D.D.S., *Lecturer on Dental Economics and Secretary of the School and of the Faculty.*

INSTRUCTORS.

BIRKLAND, JAMES WILLIAM, D.D.S., *Clinical Instructor in Operative Dentistry.*

LOUDERBACK, ANDREW VACHEL, M.S., D.D.S., *Instructor in Histology and Bacteriology.*

MACFARLANE, GEORGE BUCHANAN, D.D.S., *Clinical Instructor in Operative Dentistry.*

METHVEN, HUSTON FRENCH, D.D.S., *Instructor in Prosthetic Dentistry.*

POUNDSTONE, GEORGE C., D.D.S., *Assistant in Materia Medica and Therapeutics.*

WALDBERG, BENJAMIN, D.D.S., *Superintendent Prosthetic Laboratory.*

DEMONSTRATORS FOR 1906-1907.

BAKER, CHARLES REEDER, D.D.S., *Demonstrator in Orthodontia.*

BROSNIHAN, FRED HUGH, D.D.S., *Demonstrator in Prosthetic Dentistry.*

CONKLIN, BISHOP ALBERT, D.D.S., *Demonstrator in Operative Dentistry.*

CONVERSE, CHARLES HENRY, D.D.S., *Demonstrator in Operative Technics.*

CROSSLEY, ELIJAH ROCKHOLD, B.S., MD., *Demonstrator in Anatomy.*

EASTON, WILLIAM THOMAS, D.D.S., *Examiner.*

FOX, GEORGE THOMAS, D.D.S., *Demonstrator in Operative Dentistry.*

HILLIS, DAVID SWEENEY, M.D., *Demonstrator in Anatomy.*

MAXWELL, GEORGE HENRY, D.D.S., *Demonstrator in Operative Dentistry.*

MURRAY, JAMES EDWARD, D.D.S., *Demonstrator in Operative Dentistry.*

PARTRIDGE, BENJAMIN SHERWIN, D.D.S., *Demonstrator in Operative Dentistry.*

PUFFER, GEORGE ROBERT, D.D.S., *Demonstrator in Operative Dentistry.*

SEARL, CHARLES LUTHER, D.D.S., *Demonstrator in Operative Dentistry.*

SHUTTLEWORTH, THOMAS, *Demonstrator in Prosthetic Dentistry and Assistant in Oral Surgery.*

STREET, CHARLES ABRAHAM, D.D.S., *Demonstrator in Extraction.*

WARE, HARRY ALEXANDER, M.D., *Demonstrator in Anatomy.*

IMPORTANT!

Northwestern University Dental School believes that the increase of the requirements for admission, from two years of high school work to graduation from an accredited high school, or an equivalent, will greatly help to elevate the standard of the dental profession, and to promote its usefulness to the people. The Faculty was, therefore, glad to comply with the rules of the Illinois State Board of Dental Examiners and of the National Association of Dental Examiners, requiring that beginning with the school year 1906-07, students entering dental schools shall have a "minimum preliminary education of not less than graduation from an accredited high school or its equivalent."

This school conforms in its requirements for admission to the laws regulating the practice of dentistry, and to the rules of the National Association of Dental Examiners; and in every State its graduates are recognized and are admitted to the examinations for license to practice. Such conformity is of the greatest importance, since students entering a dental school in 1906-'07, or later, will, when graduated, find themselves excluded, by the rules of the dental examiners, from examination for license to practice dentistry, unless they are able to present a duly authenticated diploma or certicate showing that they did possess, when admitted to the school, the required preliminary education.

The following is an extract from an Act of the Legislature of the State of Illinois, approved May 18, 1905:

"Section 4. Said Board of Dental Examiners shall make rules or regulations to establish a uniform and reasonable standard of educational requirements to be observed by dental schools, colleges or dental departments of universities, and said board may determine the reputability of those by reference to their compliance with said rules or regulations."

The following is an extract from the rules of the Illinois State Board of Dental Examiners:

"Rule 1. The following preliminary qualification of students shall be required:

Graduates of Dental or Medical Schools or Colleges, who enter the colleges or schools as freshmen on or after the school year 1906-07, *must have a minimum preliminary education of not less than graduation from an accredited High School or its equivalent, prior to entering said Dental or Medical School, to entitle him or her to an examination by this board for a license to practice dentistry in the State of Illinois.*

An applicant who has not a duly authenticated diploma or certificate, shall present to this board a certificate from the State Superintendent of Public Instruction, equivalent officer or deputy that the applicant did at his or her entrance of the freshman year possess an education equivalent to that attained in an accredited High School, which certificate shall be accepted in lieu of a diploma."

LOCATION AND EQUIPMENT.

The Dental School, located in Northwestern University Building, at the corner of Lake and Dearborn Streets, Chicago, was founded and is maintained for the purpose of preparing young men and women in the most thorough manner for the practice of dentistry, and for the promotion of dental science and literature. No expense has been spared in its equipment or in the employment of an adequate faculty of skilled teachers, with a large force of demonstrators and assistants. This school occupies the three upper floors of the University Building, and has over 60,000 square feet of floor space. This space is arranged especially for the purposes of teaching dentistry, and is supplied with modern equipment for that end.

The Clinic Room, sufficient in extent to accommodate the great clinic and the offices connected with it, is of the best design and construction, consisting of a single room with arched ceiling. It is on the sixth floor, with free light on two sides and abundant skylight.

REQUIREMENTS FOR ADMISSION.

The candidate may be admitted to this school upon presenting a high school diploma or equivalent certificate, or upon passing a satisfactory examination. The diploma must be signed by a superintendent of schools, or the principal of a high school, or other responsible school officer. A certificate showing that a candidate has been graduated from an accredited high school, or from a school giving an equivalent course, signed by a city or county superintendent of schools, or by a state superintendent of public instruction will be accepted as the equivalent of a diploma. A candidate who does not present a diploma or certificate must take an examination before a state superintendent of public instruction, or his deputy, and bring a report showing that the candidate has a preliminary education equivalent to that to be obtained in an accredited high school.

The deputy state examiner, appointed by the Illinois state superintendent of public instruction, is Mr. Peter A. Downey, Fort Dearborn Building, 184 Clark Street, 4th floor, Chicago. A candidate coming from another state may, if more convenient, take his examination before the state superintendent of instruction or deputy in his own state.

Students are not admitted to the regular course of study later than ten days after the opening of the school, unless necessarily detained by illness, certified to by the attending physician, and in this case they are not admitted later than twenty days after the opening of the school. Special students, not candidates for a degree, are received at any time and allowed to select the studies they prefer.

Students are advised to register early and they will find it to their advantage to do so, since the assignment of places in lecture halls and laboratories is made in the order of registration. Students who matriculate are understood to agree thereby to accept loyally the discipline imposed by the faculty.

CANDIDATES FOR ADVANCED STANDING.

Candidates for advanced standing must present certificates from recognized schools, and are credited with work done which is satisfactory to the dean of this school and to the professor of the department concerned.

Graduates of recognized medical schools are credited with one year.

REQUIREMENTS FOR GRADUATION.

The degree of Doctor of Dental Surgery is conferred upon those candidates not less than twenty-one years of age, of good moral character, who have completed satisfactorily the required courses of study and have passed the examinations thereon, and have completed all technical and practical laboratory and clinical requirements. No student will be recommended for a degree who has not been a member of this school during the whole of the last or senior year. The standing of students is based upon examinations, monthly reports of attendance, quizzes, and infirmary practice.

No student will be recommended for a degree until all financial obligations to the University shall have been discharged.

CURRICULUM.

The course of study covers three years of thirty-two weeks each, not counting holidays or vacations, each week including six days of teaching. A course of four years will be arranged, on request, for students who desire to spend four years in completing the curriculum, or who must spend part of their time in other employments.

The calendar will be found on Page 2.

The annual fees in force for the year 1907-8 are as follows:

Registration	$ 5.00
Breakage	1.00
Tuition	150.00

A deposit of $5.00 in the Chemical and also in the Histological laboratory will be required of Freshman and Junior students. These deposits will be returned at the end of the school year, less a charge for materials

or apparatus lost or destroyed while in the care and keeping of the student.

The establishment of a final examination and diploma fee of $25.00, to begin with the year 1908-9, is contemplated.

Lockers for the keeping of students' instruments, engines and extra garments are furnished at a rental of 50c per annum. Each student is required to furnish a padlock of his own for his locker.

Bills are due not later than October 20. An extension of time is allowed in cases of necessity, but only upon written authorization of the secretary. Interest at the rate of six per cent is charged after October 20 for the use of the money and the trouble involved.

Fees are not returned to students who are suspended or expelled or absent for any cause except illness. Payments should be made in currency or in Chicago exchange drawn to the order of the Secretary of Northwestern University Dental School.

Rooms and board may be obtained in neighborhoods convenient to the school at $4.00 to $6.00 a week. Rooms without board, furnished or unfurnished, may be had at $6.00 to $10.00 a month.

THE COURSE FOR GRADUATES AND PRACTITIONERS.

This course opens on June 1, 1908, and on the first Monday of each June and continues four weeks, with six days of teaching each week. It includes two hours of lectures and six hours of practical teaching each day, by members of the regular staff of the school.

The studies for 1907 are:

Operative Dentistry—Professor G. V. Black, assisted by Professor A. D. Black, and others.

Histology, as Applied to Operative Dentistry—Professor Fred B. Noyes.

Oral Surgery—Professor Thomas L. Gilmer, and assistants.

Materia Medica—Professor Elgin MaWhinney.

Prosthetic Dentistry—Professor J. H. Prothero and assistants.

Orthodontia—Professor I. B. Sellery.

Especial attention is given to porcelain and gold inlays, crowns, bridge work of all kinds, the treatment of pyorrhœa, and the most recent methods in Operative Dentistry, Oral Surgery, and Orthodontia.

Certificates are given to those who complete the course.

1907.

POST-GRADUATE COURSE.

LECTURE SCHEDULE.

Hours.	Monday.	Tuesday.	Wednesday.
8:30- 9:30	MaWhinney	Gilmer	Sellery
9:30-10:30	Prothero	Black	Prothero
Hours.	**Thursday.**	**Friday.**	**Saturday.**
8:30- 9:30	MaWhinney	Sellery	A. D. Black
9:30-10:30	Black	Noyes	Prothero

Oral Surgery Clinic by Dr. Gilmer, Friday, 10:30-12:30.

The Laboratory and Clinic will occupy the rest of the time until 5:30 P. M.

FEES.

Registration .....$ 5.00
Tuition for one subject 45.00
Tuition for two or three subjects 60.00
Tuition for entire course 70.00

To graduates of Northwestern a reduction of twenty per cent will be made on tuition fee.

For further information relating to the Dental School, address, The Secretary, Northwestern University Dental School, Northwestern University Building, Lake and Dearborn Streets, Chicago, Illinois.

COURSE OF STUDY.

The regular session of 1907-1908 will begin on Tuesday, October 1st, 1907. The regular work of the school year will begin immediately upon the organization of the respective classes. The courses of instruction are progressive and extend over a period of three years, the teaching in one year not being repeated in the next. The students are strictly graded into Freshmen, Junior and Senior classes, each having its separate and distinct courses of study. No professor delivers lectures to more than one class at one time. Therefore, in each class throughout the whole period the teaching is directed solely to the particular class. In the operative and prosthetic clinic rooms the teaching by the corps of demonstrators is directed to the individual student and adapted to his individual needs. These are, therefore, occupied by the junior and senior classes in common.

EXAMINATION QUESTIONS.

For some years past it has seemed to be essential to the best progress of dentistry and especially the development of dental education that dental schools frequently publish the questions used in their examinations for the year, or that they exchange such lists with each other. Our dental school system has been the outgrowth of the joint work of the National Association of Dental Faculties, and the National Association of Dental Examiners. Both of these have been made possible, and have been stimulated to better effort, by the organized dental profession in its society work. The effort has been to bring all of these forces for good into more harmonious relationship and to place the schools more in touch with each other and with the general profession. Greater knowledge of what each is doing cannot be obtained more rapidly or more certainly than by a study of the questions used in the examination of its students. If the examination questions of each dental school could be studied and compared by the teachers in the other schools, this would probably do more than any other one thing to bring the schools into greater harmony in their work, and lead them to higher and better development.

There is no other one thing more needed by the State Boards of Examiners to enable them to properly arrange their questions to applicants for license to practice, than the questions used in examinations by the schools from which the students come. These questions constitute an index to the subjects taught, to the scope of their presentation, and illustrate the progress of educational effort. It therefore seems eminently proper that the state boards have these lists. Some systematic way of doing this seems desirable.

To our alumni the questions used in *Northwestern University Dental School,* during the school year 1906-07, which are published in this bulletin, will be of especial interest as an index to the teaching done during the past school year. We hope that the comparison of them with the questions used when each alumnus was in school will show a degree of progress which will be commended.

ANATOMY.

PROF. CHARLES LOUIS MIX.

FRESHMAN—MID-TERM.

February 2, 1907.

1. (a) Name *all* the parts of the alimentary canal.
   (b) Name the branches of the abdominal aorta.
2. Name and locate the five lobes and five fissures on the under surface of the liver. Answer by diagram, if you wish.
3. (a) Name the branches from each of the three divisions of the axillary artery.
   (b) Name the branches of the brachial artery.
4. Draw a plan of the brachial plexus and label the nerves issuing from it.
5. Describe the musculo-cutaneous nerve, its course, relations, branches, and their supply.
6. Name the muscle or muscles inserted into—
   (a) Base of metacarpal bone of thumb.
   (b) Base of metacarpal bone of index finger.
   (c) Base of metacarpal bone of middle finger.
   (d) Base of metacarpal bone of little finger.
7. Name in order from the radial side the nine extensor tendons passing through the six compartments beneath the posterior annular ligament.
8. Name the twenty muscles of the hand, and the nerve-supply of each.
9. Give the cutaneous nerve-supply of both the dorsal and palmar surface of the fingers and hand.
10. (a) Origin and insertion of supinator brevis.
    (b) Orgin and insertion of biceps.

FRESHMAN.

March 12, 1907.

(*Second Examination.*)

1. Describe the origin and insertion of each of the three heads of the triceps.
2. Give the origin, insertion, nerve-supply and action of the two teres muscles.
3. Describe the origin, course, branches and supply of the circumflex nerve.

4. Describe the origin, course, branches and supply of the musculo-spinal nerve as far as its division into radial and posterior interosseous.
5. Describe by diagram or in words the relations of the two teres muscles and the scapular head of the triceps to each other, and name the contents of the triangular and quadrilateral spaces formed by them.

Freshman—Final.

May 21, 1907.

1. Briefly describe the femur, both extremities and the shaft.
2. Name all the muscles originating from it, or inserted into it.
3. Describe Scarpa's triangle. Bound it, tell what its floor is made of and what it contains.
4. Describe the course of femoral artery, give its relations, name its branches, and give their supply.
5. If the leg were cut through completely at a line three inches below the knee what muscles would be severed?
6. Name the muscles of the sole of the foot in strata, and after each muscle write the name of the nerve supplying it.
7. Describe the origin, course, and relations of the anterior tibial artery. Name its branches and give their supply.
8. Give the origin and insertion of each of the three hamstring muscles.
9. Name the nerves leaving (a) the lumbar plexus and (b) the sacral plexus.
10. Describe the blood-supply of the sole of the foot and toes. Answer by diagram if you wish.

Junior.

December 11, 1906.

(*Osteology.*)

1. Name and locate 20 "points" on the three surfaces of the petrous portion of the temporal bone.
2. Describe the superior surface of the middle fossa of the skull.
3. Describe completely the occipital bone.
4. Give the articulations (a) of the ethmoid; (b) of the palatal bone.
5. Name the foramina of exit for each of the 12 cranial nerves.

JUNIOR.

January 16, 1907.

(*Myology of the Head and Neck.*)

1. Name the muscles of the orbit and the nerve supply of each.
2. Name 10 extrinsic muscles going to form the orbicularis oris.
3. The origin, insertion, nerve-supply and action of the masseter.
4. The origin, insertion, nerve-supply and action of the external pterygoid.
5. The origin, insertion, nerve-supply and action of the sterno-mastoid.
6. Draw a diagram showing the boundaries of the 5 triangles of the neck.
7. Name the 4 infra-hyoid, and the 6 supra-hyoid muscles, with the nerve-supply of each.
8. Name the 4 extrinsic muscles of the tongue, and tell into what portion each passes.
9. The origin, insertion and course of the tensor palati muscle.
10. Briefly describe the deep cervical fascia, by diagram or in words.

JUNIOR.

April 10, 1907.

(*Arteries, Veins, and Lymphatics of the Head and Neck.*)

1. Name the branches of the vertebral artery, and the branches of the occipital artery. Which of these anastomose with one another?
2. Name all the arteries found in the superior carotid triangle. Name the arteries found in the subclavian triangle.
3. Describe the circle of Willis, telling the arteries which enter into its formation, and the large arteries which leave it.
4. Name all of the branches of the ophthalmic artery.
5. Describe the course of the facial artery, and name all of its branches.
6. Name the four jugular veins and tell into what veins they empty. Describe by words or by diagram the origin of the temporo-maxillary vein, and the fate of its two divisions.
7. Locate the sinuses of the dura mater.
8. Name the contents of the cavernous sinus and give their location. Answer by diagram, if you wish.
9. Name the 4 sets of the veins of the diploë, and tell what each set drains into.

10. Describe the *deep* cervical lymphatic glands, telling into what sets they are divided, where located, their numbers, and important relations.

JUNIOR.

May 8, 1907.

(*Nerves of the Head and Neck.*)

1. Describe the course from the Gasserian ganglion of the superior maxillary nerve, and name its branches and give their supply.
2. Describe the course from the Gasserian ganglion of the inferior maxillary nerve, and name its branches and give their supply.
3. Name the branches of communication of the 7th nerve. Name the branches of distribution and give their supply.
4. Describe from its superficial origin the course of the *right* 10th nerve, including its two ganglia. Name *all* the branches of distribution and their supply.
5. (a) Describe by diagram or in words the course backward taken by the taste fibers from the side of the tip of the tongue.
   (b) Name (6) important cervical nerves and give their supply.

JUNIOR—FINAL.

May 21, 1907.

1. Describe the petrous portion of the temporal bone, its base, apex, borders, and surfaces, and the anatomic "points" on its anterior, posterior, and inferior surfaces.
2. Describe the superior maxilla, telling what cavities, fossæ, and fissures it helps to form, naming and locating its four processes, and naming and describing the four surfaces of its body.
3. Describe the muscular substance of the tongue, naming both its intrinsic and its extrinsic muscles.
4. The origin, insertion, nerve-supply and action of the levator palati, and (b) of the superior constrictor.
5. Describe the mechanism of swallowing, naming the muscles sharing in the act.
6. Name the contents of the inferior carotid triangle.
7. Name the four jugular veins, and give their origin, course, tributaries, and destination.
8. Describe the origin, course, relations, and name the branches of the internal carotid artery.
9. Describe the ophthalmic division of the fifth nerve, including its ciliary ganglion.
10. Name the five petrosal nerves, giving their origin, course, and destination.

PHYSIOLOGY.

PROF. TWING BROOKS WIGGIN.

Freshman—Mid-Term.

February 4, 1907.

1. What variation do we find in the make-up of the blood in different parts of the circulation?
2. What are the causes of coagulation, and how may it be aided and retarded?
3. Give four uses for the blood.
4. Name, and what are the functions of the outer and middle coats of arteries?
5. What makes the heart sounds, where are they heard, and why?
6. Describe the blood as it is studied flowing through a small artery in the web of a frog's foot.
7. Give five forces of the blood in circulation and four proofs of a circulation.
8. What is respiration? Define and describe inspiration; expiration.
9. What changes take place in the air and the blood after breathing?
10. How is the respiratory center stimulated? What is dyspnœa, asphyxia, and describe the condition of the vascular system in asphyxia.

Freshman—Final.

May 23, 1907.

1. By what method is absorption accomplished?
2. What is nitrogenous equilibrium? Explain the formation of urea.
3. Divide into groups and describe in the most simple manner the foods needed by man.
4. What is the source of animal heat and what is a calorie?
5. How is the temperature of the body regulated, and how do you account for the loss of heat by the skin?
6. Describe the process of the secretion of the urine.
7. What influence has the nervous system on the secretion of sweat?
8. What is muscle plasma and muscle serum, and what do muscle extracts contain?
9. How may contractility in muscle be called forth?
10. What is the condition of muscle in rigor mortis and what causes rigor mortis?

JUNIOR—MID-TERM.

January 30, 1907.

(*Nervous Physiology.*)

1. Give functions of nerve centers, define reflex action, and what things are necessary to reflex action.
2. Of what, from a physiologist's point of view, is the spinal cord made up?
3. Describe the conducting paths in the spinal cord.
4. Name the principal superficial and deep reflexes dependent upon the spinal cord.
5. Name the special centers in the cord.
6. Give the function of the medulla and name its special centers, with example of each.
7. What is the corona radiata, and what happens when hemorrhage takes place into the internal capsule?
8. Describe the corpora quadre gemini, and give their function.
9. Of what is the cerebrum composed? How is it arranged and divided?
10. Describe the microscopic structure of the cerebrum.

JUNIOR—FINAL.

May 17, 1907.

(*Nervous System.*)

1. Name the cranial nerves, and give their orgin and division by function.
2. What follows paralysis of the motor-oculi nerve?
3. Describe the origin of the fifth nerve.
4. How do the three main branches of the fifth nerve leave the cranium?
5. Give the distribution of the fifth nerve.
6. Name and describe the situation of the ganglia of the fifth nerve.
7. What symptoms indicate an interference with the normal action of the fifth nerve?
8. What results from division of the facial nerve?
9. Give the function of the pneumogastric or tenth nerve.
10. What are the functions of the spinal accessory and hypoglossal nerves?

HISTOLOGY.

PROF. FREDERICK BOGUE NOYES.

FRESHMAN—MID-TERM.

January 31, 1907.

1. Define Histology.
2. Give the structural differences between voluntary and cardiac muscles.
3. What is a Neuron?
4. What is intermediate between the sensory neuron and the stimulus to which they respond.
5. Give a classification of the connective tissues.
6. State differences between white and elastic connective tissue fibres.
7. Describe an involuntary muscle cell.
8. Name three kinds of epithelium and give an example of each.
9. (a) What are the two kinds of cell division?
   (b) Name the stages of indirect cell division.
10. What is Protoplasm?

FRESHMAN—FINAL.

May 20, 1907.

1. (a) Define Histology.
   (b) What is a typical cell?
2. (a) Of what two parts are all tissues made up?
   (b) What properties are given to the tissues by each?
3. (a) What are the vital manifestations of cells?
   (b) What is the fundamental idea of karyokinosis?
4. Describe stratified squamous epithelium.
5. What are the differences between the white and the elastic fibrous tissues?
6. Describe the cellular elements of the blood.
7. Give the structural differences between the voluntary and involuntary muscle fibres.
8. Describe the structure of a villus.
9. What are the following structures and where are they found: Crypts of Lieberkühn, Glands of Brunner, Malpighian bodies, Capsule of Glisson, Peyers patch.
10. Identify the three sections under the microscopes as you pass out, and write on your paper simply the name of the tissue.

Junior—Mid-Term.

February 4, 1907.

1. Compare the structure of the tooth and the hair.
2. How does the enamel differ from all other calcified structures?
3. Describe the action of acid on the enamel, and compare it with the action on dentin.
4. What causes the appearance of striation in the enamel and what does it record?
5. Describe the directions of the enamel rods as seen in a bucco-lingual section of a bicuspid.
6. What are the structural requirements for strong enamel walls?
7. What structural explanation is there for the spreading of caries at the dento-enamel junction?
8. What is the diameter of an enamel rod?
   (b) What is the diameter of a dentinal tubule?
9. What are the interglobular spaces in the dentin?
10. What are the differences between cementum and bone?

Junior—Final.

May 20, 1907.

1. (a) What is Homology?
   (b) With what structures are the teeth homologous?
2. Compare the action of acid on enamel and dentin.
3. (a) How does the enamel differ from all other calcified tissues?
   (b) Compare the enamel and the dentin in their relation to their formative organs.
4. Give structural requirements for strong enamel wall.
5. Describe the structure of the gingival wall, disto-occlusal cavity in the superior first bicuspid.
6. Describe the structure of the buccal wall in a simple occlusal cavity in a lower first bicuspid.
7. Describe the dentinal tubules.
8. What are the following and where are they found: Interglobular spaces, granular layer of Tomes, ameloblasts, osteoblasts, sheaths of Newman.
9. Describe the structure of the blood-vessel walls in the pulp.
10. What are the principal fibres of the peridental membrane and describe their arrangement with reference to the physical function of the membrane.

GENERAL PATHOLOGY.

PROF. TWING BROOKS WIGGIN.

JUNIOR—MID-TERM.

January 31, 1907.

1. What is Pathology, General and Special? Etiology? Disease?
2. Give an example and define Hereditary Predisposition, Immunity, Predisposing and Determining Causes of Disease.
3. Classify poisons by their action and give one example of each kind.
4. What are the most important causes of diseases and how do you classify diseases due to Bacteria?
5. How may micro-organisms enter the body?
6. What is Fever, to what is it due and what are its pathologic results.
7. How would you recognize areas the seat of active and passive hyperemia?
8. Of what may emboli be composed and what may result from their lodgment?
9. How are metastatic abscesses caused?
10. What changes may occur in simple and infected thrombi?

JUNIOR—FINAL.

May 22, 1907.

1. How do degenerations differ from infiltrations?
2. What are the causes of cloudy swelling, and how does an organ look that is the seat of this degeneration?
3. Name the causes and give the results of necrosis.
4. Define inflammation and describe the changes in the circulating vessels of an inflammatory area.
5. Name the clinical symptoms of inflammation and tell what causes them.
6. How may the causes of inflammation be classified and define these causes?
7. How does inflammation extend and how is it arrested?
8. What are the effects of inflammation on the tissues, and what changes follow it?
9. How does an abcess cavity form and heal? Describe healing by immediate union, first and second intention.
10. What are the chief signs of malignancy in any tumor; and how can you differentiate clinically between sarcoma and carcinoma?

CHEMISTRY.

PROF. VERNON JAMES HALL.

FRESHMAN—MID-TERM.

February 1, 1907.

1. Distinguish clearly between chemical and physical changes, and illustrate.
2. Describe the occurrence, preparation and properties of oxygen.
3. Describe the preparation, properties and uses of hydrogen dioxide or "pyrozone."
4. Describe the preparation and properties of nitric acid.
5. Name and give the formulas of the oxides of nitrogen and describe the preparation, properties and uses of nitrous oxide or "laughing gas."
6. Define symbol, element, compound, oxide, acid, base, salt.
7. State and illustrate the laws of definite and multiple proportions.

JUNIOR—MID-TERM.

February 6, 1907.

(*Organic.*)

1. Define *organic chemistry,* and name the chief elementary constituents.
2. What do you understand by Homologous series? Illustrate.
3. What are unsaturated hydrocarbons; give example.
4. What are primary, secondary and tertiary alcohols?
5. Describe alcoholic fermentation.
6. Give formula and tell all you know about: Methane, ethyl alcohol, chloroform, ether.
7. Give formula for formic aldehyde. What is formalin?
8. What is an ester?
9. Describe how soap is made. What is the chief by-product in soap manufacture?
10. Describe glycerin, how obtained, and name its uses. Give formula.

PROF. HARRY M. GORDIN.

Freshman—Final.

May 25, 1907.

(*Inorganic.*)

1. How can hydrochloric acid be made? Give equation.
2. How can sodium carbonate be changed to sodium bicarbonate? Give equation.
3. How can sodium bicarbonate be changed to sodium carbonate?
4. What is formed when a base is treated with an acid. Give example by equation.
5. How would you prove the presence of barium chloride in a solution?
6. The formula of phosphoric acid being H_3PO_4 and the valency of Ba 2, what is the formula of barium phosphate?
7. How can gold be separated from silver?
8. How many volumes of water vapor are obtained from 2 volumes of hydrogen and one volume of oxygen?
9. What is a mono-di-and tribasic acid?
10. What is permanent hardness and temporary hardness of water?

Junior—Final.

May 18, 1907.

(*Organic.*)

1. Define a hydrocarbon and a carbohydrate. Give one example of each.
2. Define an alcohol and show how it can be made from a hydrocarbon.
3. What is a phenol and what is ordinary phenol? (Give formula.)
4. What is an ester? Give formula of an ester.
5. What is an asymmetric carbon atom? Give example.
6. What is aniline and how is it made from benzene?
7. What is obtained by oxidizing toluene?
8. What is a soap?
9. How can ethane be made from methane?
10. Give formula of monochlor-acetic acid and of acetyl chloride.

COMPARATIVE ANATOMY.

PROF. GEORGE AMOS DORSEY.

JUNIOR—FINAL.

December 21, 1907.

1. State the difference between Evolution and Natural Selection. What is meant by survival of the fittest?
2. Define briefly homology, bunodont, monophyodont, sectorial, desmodont, marsupial, and "typical mammalian dentition."
3. Describe the dentition of
   (a) A teleost fish.
   (b) An elasmobranch fish.
4. Locate in proper order and describe dentition of
   (a) Hippopotamus.
   (b) Dog.
5. (a) Give the classification of the primates.
   (b) Compare the skeleton of man with that of the gorilla.

MATERIA MEDICA.

PROF. ELGIN MAWHINNEY.

JUNIOR—MID-TERM.

February 1, 1907.

1. Define Pharmacology, Toxicology, Therapeutics, Remedy, Medicine.
2. Define Abstract, Extract, Tincture, Alkaloids, Unguentum.
3. By what routes are drugs administered?
4. Name six agencies that modify the action of medicine.
5. In a compound prescription, how do you determine amount of each drug contained therein?
6. What are the points to be observed in hypodermic medications?
7. What is meant by incompatibles?
8. What are Escharotics? Name six drugs belonging to this class.
9. What are Counter-irritants? Name four valuable drugs so classed and tell where and how you would use each.
10. What are Astringents? Name and give source and therapeutics of eight drugs so classed.

JUNIOR—FINAL.

May 24, 1907.

1. Define Materia Medica, Pharmacy, Pharmacopœia, Formula, Prescription.
2. What are Antagonists, Antidotes, Incompatibles?
3. How would you determine the amount of each drug to put into a compound prescription?
4. Write a prescription for a mouth wash containing at least 6 of the following, but no other ingredients: Boric Acid, Borax, Bicarbonate of Soda, Thymol, Phenol, Glycerin, Oil of Peppermint, Water.
5. Name two classes of Hemostatics. Explain the action and name two drugs in each class.
6. Give source, physiological action and therapeutic uses for Arsenic.
7. What are Antiseptics? Name 8 drugs so classed and tell where you would use each.
8. Explain the difference between direct and indirect stimulants. What are the indications for the use of a cardiac stimulant? Name 4.
9. What are Sedatives? When should they be used? Name 4 drugs so classed.
10. Give source and physiological action of cocaine. What are the symptoms of cocaine poisoning, and what would you do in a case of poisoning from injection of cocaine into the gums?

PROSTHETIC DENTISTRY.

PROF. JAMES HARRISON PROTHERO.

FRESHMAN—MID-TERM.

January 30, 1907.

1. What is an impression?
2. What is a model?
3. How would you select a tray suitable for taking an impression of a full upper case, all of the teeth being present?
4. Describe the steps of securing a model from a plaster impression.
5. What is an occluding frame, and why is such an appliance necessary in laboratory procedures?
6. What is the object in using the face bow?
7. What is the object in using wax base plates in denture construction?

8. (a) Describe the line of arrangement of a full upper case when viewed occlusally.
   (b) Describe the appearance when viewed buccally.
9. What relation to the upper teeth do the buccal marginal ridges of the lower bicuspids and molars sustain when in full occlusion?
10. What is vulcanization?

FRESHMAN—FINAL.

May 24, 1907.

(*Metallurgy.*)

1. (a) What is metallurgy?
   (b) What is metallography?
2. Define the following:
   (a) An element.
   (b) A compound.
   (c) An ore.
   (d) A mineral.
   (e) Noble metal.
   (f) Native metal.
3. (a) What is malleability? (b) Ductility? (c) Tenacity?
4. A piece of metal weighs 8 oz. in air and 3 oz. in water. What is its specific gravity?
5. (a) What is welding? (b) What is soldering?
6. (a) What is an alloy? (b) What is a dental amalgam alloy? (c) Give formula. (d) What is the object in alloying metals?
7. What is an amalgam?
8. Give percentage of carbon in wrought iron, steel and cast iron.
9. What is hardening and tempering of steel?
10. Give colors which appear on the surface of polished steel in tempering, in regular order.
11. Give method of refining gold scraps.
12. What is meant by the terms (a) Carat; (b) Gauge; (c) Solder?
13. Reduce a $10.00 gold piece to 20 carat by using 16 carat gold.
14. Reduce a $10.00 gold piece to 16 carat by using silver.
15. What would be the result of passing a current of electricity of moderate intensity through a chain composed of alternate links of platinum and silver?

JUNIOR—MID-TERM.

February 4, 1907.

1. Define Prosthetic Dentistry.
2. What are the principal objects to be attained in *supplying* the lost natural teeth by artificial means?
3. Name the requisite qualities of a good impression material.
4. Mention the points to be noted in examining a mouth prior to taking an impression.
5. (a) Why do upper dentures sustain their position in the mouth in opposition to the laws of gravity?
   (b) What forces besides gravity tend to displace dentures of this class?
6. State why impressions and models should be scraped, and mention usual locations where such steps are necessary.
7. The base plates being constructed, describe the steps of securing the normal relation of the lower to the upper jaw.
8. What is the object in using face bow?
9. Describe briefly the four basal temperaments and mention the color and form of teeth appropriate to each.
10. (a) What is vulcanization?
    (b) What chemical changes occur during this process?
    (c) What is the cause of porosity in bulky cases?

JUNIOR—FINAL.

May 22, 1907.

1. What gauges and carat of gold are used in the construction of partial dentures?
2. Give formula for (a) Clasp metal; (b) Haskell's Babbitt metal; (c) Counter-die metal; (d) Melotte's metal.
3. (a) Describe the construction of a bicuspid clasp?
   (b) What gauges of clasp metal are usually used?
   (c) Mention the conditions calling for the use of thin, medium and thick clasp metal.
4. The base plate and clasps having been constructed, describe the steps of securing their correct relation to each other for final soldering.
5. How may the correct location for the wire line on the lingual portion of a full upper base plate be determined?

6. Patient desires full upper and lower dentures. General form—tall, angular, square-built, complexion brownish, hair and eyes black. What temperament is indicated, and what color and form of tooth should be used?
7. What is the object in using the face bow?
8. What is the meaning of crown in its dental application?
9. Describe (a) A shell crown; (b) a porcelain-faced crown.
10. What is bridgework?
11. What are abutments and piers?
12. State some of the conditions necessary to success in the introduction of fixed bridgework.
13. What might be considered the ideal number of supports for a bridge?
14. Why does fixed bridgework frequently prove a failure?
15. Is plaster of Paris capable of being compressed? If so, what effect has this movement on denture construction?

Senior—Mid-Term.

February 4, 1907.

1. How do *porcelain* crowns rank, from an esthetic standpoint, as substitutes for natural crowns?
2. Mention the advantages and limitations of crowns of this class.
3. Describe the "Jacket crown" and state the most common location where indicated and why.
4. Mention some of the advantages and disadvantages of porcelain bridgework.
5. What is the object in using a saddle in substitutes of this class?
6. What is the meaning of the word "inlay" in its dental application?
7. (a) What can you say of the origin of this class of work?
   (b) To whom does credit belong in recent years for having initiated the present methods of using a platinum matrix and high fusing body?
8. What is the difference between high and low fusing porcelain?
9. Mention the advantages and the disadvantages of porcelain inlay work.
10. Mention the five locations in which porcelain is indicated ranging from the most to the least favorable class.

Senior—Final.

May 21, 1907.

1. Describe in detail the reason for using the face bow.
2. What is the object to be attained in arranging teeth so as to secure three point contact?
3. Describe briefly the four basal temperaments and give the color and form of teeth appropriate to each.
4. Mention the several points of importance to be noted in fitting base plates in the mouth.
5. What is a removable bridge and where are substitutes of this class indicated?
6. Describe briefly and name three forms of attachments used for retaining removable bridges and partial dentures in position in the mouth.
7. Mention the conditions necessary to insure success in replacing teeth with fixed bridgework.
8. What are removable facings and why can they be used to advantage in some cases? Mention some of those in use at present.
9. Describe the steps of repairing a fractured central incisor facing on a fixed bridge.
10. What gauges and carats of gold plate are used in constructing gold base dentures?
11. What is meant by the terms (a) Carat; (b) Solder; (c) Plate; (d) Flux; (e) Reducing flame?
12. Name the ingredients entering into the composition of porcelain and mention the property imparted by each.
13. Mention the advantages of and objections to continuous gum dentures.
14. What are the advantages and disadvantages of plaster of Paris for impression and model work?
15. (a) What is an obturator? (b) What is an artificial velum? (c) What is the object sought in placing such appliances in the mouth?

ORTHODONTIA.

PROF. IRA BENSON SELLERY.

SENIOR—MID-TERM.

February 2, 1907.

1. Name all of the forces governing malocclusion.
2. Describe the line of occlusion.
3. Name all of the evils resulting from malocclusion.
4. (a) Name all of the causes that are operative in producing malocclusion. (b) Is malocclusion inherited more often than acquired? Give reason.
5. Describe fully Class II. according to Dr. Angle's classification.
6. Why should impressions be taken before attempting to correct malocclusion and what material is best to use for this purpose?
7. Describe in detail the normal position and occlusion of the lower right second molar.
8. Describe the different kinds of anchorage and tell which is indicated for use when correcting malocclusion of Class III.

SENIOR—FINAL.

May 17, 1907.

1. Tell in detail how you would diagnose and classify a case of malocclusion.
2. Describe two methods of expanding the upper arch. Tell how to expand the lower arch.
3. Describe in detail a correct method of procedure in correcting an irregularity of Class II., Division I. (Angle). What kind of anchorage is required in this case?
4. What sort of a retainer would you use to hold the upper molars and bicuspids after lateral expansion? What kind of a retainer after reducing a case of superior protrusion?
5. Upon what do we depend for permanent retention? How long should retainers be worn?
6. Give a method of drawing upper cuspid distally after first bicuspid has been extracted.
7. At what age is it best to attempt the correction of malocclusion? Why?
8. In what cases is it necessary to open the bite? Give two methods of opening the bite.

OPERATIVE DENTISTRY.

PROF. FRED W. GETHRO.

FRESHMAN—1ST QUARTER.

November 20, 1906.

(*Dental Anatomy.*)

1. (a) What is a surface angle? Give rule.
   (b) What is a line angle?
   (c) Name the line angles found on the lower cuspid.
2. Name eight points of difference between an upper central and lateral incisor.
3. Describe in detail the labial surface of an upper central, naming margins, surface angles, etc.
4. Name eight points of difference between a lower central and lateral incisor.
5. (a) What is an axial angle?
   (b) What is a point angle?
   (c) Name the axial angles found on an upper cuspid.
6. (a) How many surface angles on an upper lateral?
   (b) How many line angles on an upper lateral? Name them.
   (c) How many point angles on an upper lateral? Name them.
   (d) How many axial angles on an upper lateral? Name them.
7. Name six points of difference between the mesial and distal surfaces of an upper lateral.
8. Name six points of difference between an upper and lower cuspid.

FRESHMAN—MID-TERM.

February 5, 1907.

1. (a) What is an axial angle? How many on lower cuspid?
   (b) What is a point angle? How many on lower cuspid?
   (c) What is a surface angle? How many on lower cuspid?
2. (a) Name the grooves that rise from the central pit of the central fossa in an upper first molar.
   (b) Are any of these deeply sulcate, and which?
3. Name eight points of difference between a lower first and second molar. (Drawings accepted.)
4. Name eight points of difference between a lower and an upper cuspid. (Drawings accepted.)

5. Make a drawing showing upper right first, second and third molars with grooves, etc., or name eight points of difference between upper first and second molars.
6. Make a drawing showing upper first and second bicuspids, or name eight points of difference between upper first and second bicuspids.
7. (a) Name the roots of an upper first molar in the order of their size, naming the largest first.
   (b) Describe in detail the mesio-buccal root of an upper first molar.
8. (a) On which of the upper molars do we sometimes find a fifth cusp?
   (b) Where is it located?
   (c) What groove separates this cusp from the rest of the tooth?

9-10. On Wednesday, February 13, at 1:00 p. m., the class will please report in the Operative Technic Laboratory with all the instruments required in the Technic department. The completeness of each outfit will be marked on a basis of ten per cent, and the condition, including the cutting edges of instruments; will be marked on a basis of ten per cent. In order to receive these credits it will be necessary that the instruments be examined at the hour stated.

FRESHMAN—3D QUARTER.

March 18, 1907.

(*Operative Technics.*)

1. Name the walls found in a disto-occlusal cavity in a lower third molar.
2. (a) What is the enamel margin?
   (b) What is the dento-enamel junction?
3. Name the definite orders of procedure in cavity preparation.
4. A small cavity is found on the mesial surface of a lower first molar, just gingivally of the point of contact, conditions are normal. State in detail where and why you would place the enamel margins and give reasons.
5. State in detail the difference in consideration of a pit cavity and a smooth surface cavity.

6-7. Give the formula names for the special instruments. What does the first, second and third figures indicate?

8. What is a millimeter in inches?
   (b) What is a centimeter in inches?
   (d) What is a meter in inches?
9. Name the walls of a simple occlusal cavity where the pulp has been removed.

FRESHMAN—FINAL.

May 22, 1907.

1. Name the walls and line angles of a linguo-occlusal cavity of an upper first molar in which the pulp has been removed.
2. (a) Give the formulæ for the 44 cutting instruments.
   (b) What does the first figure indicate?
   (c) What does the second figure indicate?
   (d) What does the third figure indicate?
3. A mesio-occlusal cavity has been prepared in an upper first molar. State in detail how you would place an amalgam filling in this cavity.
4. (a) State in detail the method of filling root canals in an upper first molar.
   (b) Of an upper central.
5. A small pit cavity is found in the buccal pit on the buccal surface of a lower first molar. State in detail how you would prepare it.
6. (a) What is the enamel margin?
   (b) What is the cavo-surface angle?
   (c) What is the dento-enamel junction?
   (d) What is the enamel wall?
7. Name the definite order of procedure in cavity preparation.
8. Describe in detail what each one is.
9. A small cavity is found on the mesial surface of a lower first molar, just gingivally of the point of contact—conditions normal. How would you prepare this cavity for a gold filling? State in detail where you would place each wall, and why.
10. State in detail the difference in consideration of pit and fissure cavities and smooth surface cavities.

PROF. ARTHUR D. BLACK.

JUNIOR—MID-TERM.

February 2, 1907.

1. (a) What line angles meet the axio-gingival line angle in a proximo-occlusal cavity?
   (b) What point angles are connected by the axio-gingival line angle in a proximal cavity in an incisor?

2. (a) Give formula for smallest, least angle hoe in the college set.
   (b) Give formula for largest, greatest angle hoe in the college set.
3. Give formulæ for all instruments in the college set having angle of 6.
4. What is the horizontal plane of a tooth? What is the axio-mesio-distal plane?
5. How do you determine the proper plane for the enamel wall in any part of any cavity?
6. In obtaining outline form of a mesio-occlusal cavity, if you wish to extend the buccal, lingual and gingival margins farther than the enamel has been undermined by caries, how and with what should you proceed?
7. (a) In what position should the blade of a chisel be held in relation to the direction of the enamel rods, in breaking down enamel?
   (b) In finishing the enamel wall?
8. In preparing a third-class cavity, after outline form has been obtained, what instruments should be used to obtain the incisal retention, and for what purpose is each used?
9. How and with what kind of a bur should convenience points be prepared in the gingival portion in cavities of classes 3 and 5?
10. Under convenience form what wall inclinations are often modified in cavities of classes 1 and 5, in the lower molars, for gold fillings?
11. How should a ligature be used to force the rubber dam through a close contact?
12. Draw a diagram of a piece of rubber dam about the actual size used in the clinic and indicate where you would punch the holes to apply it over the lower right first and second bicuspids and first and second molars. Mark the edges that cover the upper and lower lips.
13. What difference should be made in the preparation of a mesio-occluso-distal cavity in an upper bicuspid with a live pulp and in one from which the pulp has been removed, and why?
14. How would you apply a universal separator for a cavity in the mesial surface of an upper central?
15. Why should a separator be used in filling proximal cavities?
16. What determines the outline form of a cavity of Class 1?

17, 18, 19 and 20. On Wednesday, February 13, at 1:00 p. m., the class will please report in the Junior Prosthetic Laboratory with operating cases and medicine cases. The completeness of each outfit will be marked on the basis of ten per cent, and the condition, including cutting edges of instruments, will be marked on the basis of ten per cent. Cases will not be examined at any other time.

JUNIOR—FINAL.

May 25, 1907.

1. (a) Why do we anneal gold for filling?
   (b) How may we be certain that gold will be in the best condition for filling when so annealed?
2. (a) How can gold be well condensed with the least pain to the patient?
   (b) About how many pounds pressure is required to condense pieces of gold of average size and thickness in filling teeth, using a 1 mm. plugger point?
3. Tell in detail how you would fill a convenience point in starting a gold filling.
4. (a) In filling a third class cavity, what part requires hand pressure to condense the gold?
   (b) In filling disto-occlusal cavities, against what walls may we be unable to get good adaptation without using hand pressure or reverse pluggers?
5. (a) What direction of force is most desirable to insure good adaptation to cavity walls?
   (b) Explain method by which good adaptation may be secured with plugger held almost parallel to wall.
6. (a) What difficulty is encountered in condensing cohesive gold on the gingival wall of mesio-occlusal cavities in bicuspids and molars?
   (b) How is this difficulty overcome? (Do not give non-cohesive method in answer.)
7. (a) What difficulty is encountered in condensing cohesive gold on the gingival wall of disto-occlusal cavities in bicuspids and molars?
   (b) How is this difficulty overcome? (Do not give non-cohesive method in answer.)

8. Tell in detail how you would prepare and place a non-cohesive cylinder on the gingival wall of a mesio-occlusal cavity in a molar.

9. (a) About how many pounds can the average person bite with the bicuspids or molar teeth?
   (b) The person with a well made bridge supported by good roots?
   (c) The person with full upper and lower dentures?

10. (a) How many pounds are required to bite through an average piece of beefsteak?
    (b) Mutton chop?
    (c) Pork chop?

11. Tell in detail how you would trim and polish a proximal gold filling in an incisor.

12. In making a filling of amalgam in a mesio-occlusal cavity in an upper first molar, give in detail everything to be done after the cavity is all prepared (the rubber dam being on), up to the point where you are ready to place the amalgam.

13. In a case where it is necessary to expose a pulp in removing carious dentin, how would you proceed?

14. (a) How can the length of a root be determined?
    (b) How can the size of the apical foramen be determined?

15. Give in detail the technic of making a root filling.

PROF. GREENE VARDIMAN BLACK.

Senior—Mid-Term.

February 6, 1907.

1. Suppose a filling in a proximal surface has been perfectly made and decay recurs:
   (a) At what points will the recurrence usually take place?
   (b) What change should have been made in the cavity preparation to prevent this recurrence?
   (c) Suppose the filling were in a gingival third buccal cavity: What would then be your answer?

2. Name the cavities in which for æsthetic reasons, you might resort to porcelain inlays instead of gold fillings.

3. (a) In occlusal cavities in lower molars, at what point are you most liable to find weak walls caused by undermining of enamel by caries?

   Answer same question in its application to the following:

   (b) Proximal surfaces of upper molars.
   (c) Proximal surfaces of upper bicuspids.

4. (a) To what uses is the Hatch clamp applied?
   (b) Describe its adjustment to a lower cuspid. (Illustrate by diagram about the size of the piece of rubber dam with the margin covering the upper lip marked, showing the position of the holes and the relation of the holes to each other.)
   (c) What would be the position of the patient in the chair, and what would be the position of the operator?

5. Describe the steps in placing the rubber dam on a third lower molar over the special clamp.

   The steps are:

   (a) Preparation of piece of rubber dam.
   (b) Adjust the clamp.
   (c) How first to take the dam in the fingers.
   (d) The second adjustment in the fingers.
   (e) The third adjustment in the fingers with the final relation of the finger ends to the hole that will go over the third molar.
   (f) The position of the patient in the chair.
   (g) The position of the operator.
   (h) The movements in placing the dam over the clamp and onto the tooth, including the movements in releasing the dam and removing the fingers.

6. (a) Why does gold weld cold while other metals do not?
   (b) What is the essential thing done by annealing in developing the welding property?

7. (a) What is the essential relation of the size of the face of the plugger to the force used in condensing a gold filling?
   (b) What is the average (about) force, in pounds, a dentist can use with the pen grasp?
   (c) About how much does this vary among different persons?
   (d) What force can *you* use?

8. What is the form and function of the normal interproximate contact point?

9. Describe step by step the adjustment of the Universal separator and the separation of the upper first and second bicuspids.
10. Describe slow separation with gutta-percha and name the conditions necessary to make it effective.
11. The Senior class will report in the Senior Prosthetic Laboratory with operating cases and medicine cases on Wednesady, February 13, at 1:00 p. m. Ten per cent on this examination will be marked on the completeness and condition of outfits. This will include the sharpness of a half dozen excavators, taken at random from set.

    Appointments with patients may be made for 2 o'clock on this day. No credit on this examination will be given on outfits examined at any other time.

PROF. GREENE VARDIMAN BLACK.

Senior—Final.

May 22, 1907.

(*Pathology of the Hard Tissues of the Teeth.*)

1. Give the physical signs or characters by which you would diagnose or distinguish (a) Abrasion; (b) Erosion; (c) Atrophy; (d) Caries; (e) White spots on the enamel occurring as developmental faults.
2. (a) What is the cause of atrophy of the teeth?
   (b) Why are the occlusal surfaces of the first molars badly marked when atrophy occurs near the incisal edges of the incisors?
   (c) What is the best treatment for the temporary protection of atrophied first molars in children very susceptible to dental caries?
3. (a) What is meant by the term supernumerary teeth?
   (b) About what age do supernumerary teeth present in the incisor region?
   (c) Under what conditions would you extract supernumerary teeth?
   (d) Under what conditions would you allow them to remain?
   and caries of dentin?
4. (a) What are the essential differences between caries of enamel?
   (b) Give the conditions that seem to control the localization of dental caries.

5. (a) What is the active agent in the production of dental caries?
   (b) By what is this active agent produced?
   (c) What is its location in relation to beginning caries of enamel?
   (d) What is its location in relation to caries of dentin?
6. (a) What can you tell me of the disposition of caries to spread on the surface of the enamel—and especially
   (b) In what classes of cavities is the disposition of caries to spread on the surface of enamel seen most, and—
   (c) In what classes of cavities is this spreading on the surface seen least?
7. (a) What is meant by areas of immunity to decay?
   (b) Make a drawing of the buccal surface of a molar and indicate the most usual place of the beginning of caries.
   (c) Mark on this the direction and probable extent of spreading in moderately bad cases.
8. (a) In what positions can you draw straight lines from occlusal to gingival on the crown of a tooth across which decay will spread least often?
   (b) What relation should the extension of cavity outline hold to the known disposition of caries to spread on the surface of the enamel in certain directions?
9. (a) Why may the deciduous incisors be separated by cutting out proximal decays while this treatment is not applicable to the permanent incisors? (b) For what especial reasons is it important that the full mesio-distal breadth of the deciduous molars be retained until the time of shedding?
10. (a) What reasons can you assign for the greater tendency to caries of the teeth during pregnancy? (b) What especial precautions are necessary in the treatment of the teeth of women during pregnancy?

BACTERIOLOGY.

PROF. EUGENE SHAW WILLARD.

SENIOR—MID-TERM.

January 31, 1907.

1. Name four culture media and what should be the chemical reaction for bacteria?
2. What is a vibrio?
3. What is the name and the size of the caries fungus?

4. What organisms belong to the T. B. Group and what distingushes them from other bacteria?
5. Give in detail the T. B. staining method.
6. What is a Petri dish? State for what purpose and describe how it is used.
7. What are the four physiological essential functions?
8. Differentiate between Gonococcus and Pneumococcus morphologically.
9. What do you understand by table stains? Name two.
10. Name six diseases found in the mouth or throat that are caused by bacteria.

SENIOR—FINAL.

May 16, 1907.

1. What three things are necessary to the growth of bacteria?
2. (a) What four ways have we for identifying species of bacteria? (b) What are the four essential physiological functions?
3. What is fermentation, and putrefaction?
4. Give the rules or laws that are applied to prove the pathogenesis of a specific bacterium.
5. By what four ways or means do bacteria produce disease?
6. What is the difference between active and passive immunity?
7. What disease is produced by the streptococcus media, and give the formulæ showing the chemical reaction that takes place when this organism is planted in broth, containing cane sugar?
8. Describe Ehrlich's theory of immunity.
9. How do Leucomains differ from Ptomains?
10. What in Bacteriology do the following terms mean?
    (1) Facultative Parasite. (2) Obligate Anærobe. (3) Bacillus. (Give the rule to distinguish from coccus.) (4) Bacteremia. (Name a micro-organism that produces this condition.) (5) Saprophyte. (6) Streptococcus. (7) Phagocyte. (8) Flagella. (9) Hyphia. (10) Sarcina.

SPECIAL PATHOLOGY AND THERAPEUTICS.

PROF. ELGIN M'AWHINNEY.

SENIOR—MID-TERM.

February 4, 1907.

1. What are odontoblasts? What is their function and what relation do they bear to the pulp and to the dentine?
2. Why is dentin sensitive? Name six valuable obtunding agents.
3. Give detail of capping exposed pulp.
4. How would you determine whether a pulp should be destroyed or capped?
5. What are the tissue changes that take place during inflammation?
6. Explain the reparative process following tissue injury.
7. Tell what you know of pulp nodules, the cause, diagnosis and treatment.
8. Give the detail of desensitizing the pulp with cocain, also detail of removing the pulp and cleaning, enlarging and filling root canals in an upper first molar.
9. Give treatment for putrescent pulp.
10. Give the symptoms and detail of treatment of an acute forming alveolar abscess—a case in which the pus has not yet made its escape through the alveolar wall.

SENIOR—FINAL.

May 20, 1907.

1. Of what is the dental pulp made up?
2. What local and general treatment would you suggest to minimize pain incident to excavating sensitive dentin?
3. (a) How would you differentiate between hyperemia and inflammation of the tooth pulp? (b) What treatment would you suggest for each?
4. What are the tissue and vascular changes that occur in the usual process of inflammation?
5. Give the detail of devitalizing and removing the pulp and filling the root canals in an upper molar where the buccal canals have been partially filled with secondary dentine.
6. (a) What is an alveolar abscess? (b) What are the usual causes, the various kinds and symptoms? (c) Give treatment for a painful, forming alveolar abscess.

7. What cases do you consider unfavorable for the use of cocaine for pulp removal?
8. How would you control severe hemorrhage following tooth extraction?
9. What is aphthous stomatitis, and what treatment would you suggest?
10. What is your treatment, both local and general, for a chronic case of phagedenic pericementitis, where there is a great quantity of pus present?

ORAL SURGERY.

PROF. THOMAS LEWIS GILMER.

SENIOR—MID-TERM.

February 1, 1907.

1. (a) What is septicemia?
   (b) What is toxemia?
   (c) What is pyemia?
2. What precautions are necessary to prevent pyogenic infection in surgical operations?
3. Name five kinds of wounds, classified according to cause.
4. In repair of wounds what are the factors determining the slowness or rapidity of repair?
5. (a) What is active hyperemia?
   (b) What is passive hyperemia?
   (c) What is œdema?
6. (a) What is a sinus?
   (b) What is a fistula?
   (c) What is an abscess?
   (d) What is an ulcer?
7. What would be your treatment of a severe case of shock?
8. What symptoms indicate caries of the upper jaw?
9. What would be the symptoms in a case of an acute suppurative inflammation?
10. What are the symptoms in a case of necrosis of the lower jaw?

SENIOR—FINAL.

May 18, 1907.

1. Give in detail method of taking impression. Making and reconstruction of casts and construction of Heath splint.
2. What are the symptoms of complete bilateral dislocation of the lower jaw?
3. What is an aneurism?
4. What are the symptoms of an aneurism of the descending palatine artery when it occurs on the hard palate?
5. How would you differentiate between an aneurism and an abscess on the hard palate?
6. (a) What is a dentigerous cyst?
   (b) What is an odontome?
7. (a) Why is it desirable to operate for cleft palate in early infancy?
   (b) Which should precede, operations on the palate or lip, providing there are clefts in each?
8. Give in detail the procedure in resection of roots of teeth for cure of persistent alveolar abscess.
9. What are the diagnostic symptoms of tic douloureux?
10. How may the third branch of the fifth nerve be reached for resection?

ANAESTHESIA.

PROF. HERMAN DURAND PETERSON.

SENIOR—FINAL.

May 15, 1907.

1. Describe the process of manufacture of nitrous oxide gas. Name its physical and physiological properties.
2. Give the physical properties of chloroform and ether. Which is the safer anesthetic, and why?
3. Describe the physiological action of ether; of chloroform.
4. Give the contra-indications for ether; for chloroform. Dangers of each.
5. What are the after effects of ether? of chloroform?
6. Describe the methods of administering ether—of chloroform.
7. Signs of danger of ether narcosis; of chloroform narcosis.
8. Describe the manner by which chloroform causes death.
9. What is meant by anesthetic mixtures? Name three.
10. Name four local anesthetics. What decides the choice of anesthetics?

ETHICS AND JURISPRUDENCE.

PROF. EDMUND NOYES.

SENIOR—FINAL.

January 30, 1907.

1. Can you formulate any fundamental principle or rule by which a good man may guide or test his conduct, whether it be in professional life, or in business, or politics, or society, or the family?
2. In what respects are the responsibilities of professional life greater, and the standards of conduct consequently higher than in ordinary business life?
3. What are the rules in respect to professional advertising, and what are the reasons for them?
4. What duties to patients are specified in the Code of Ethics of the National Dental Association; as to the manner of treating them, services to be rendered, and instructions and explanations to be given them?
5. How may a dentist become a legal practitioner in the state of Illinois?
6. What are the objects of consultations, and state briefly the mode of procedure and the formalities to be observed.
7. What does dental practice include, and what are the restrictions in respect to systemic treatment by medicines?
8. What is the standard of knowledge and skill required of dentists who give anesthetics, and what arrangements or precautions are necessary for the safety of patients and the protection of dentists?
9. What is the difference between common and expert witnesses, and the object of expert testimony?
10. Define and classify malpractice, and state the most important considerations in malpractice suits.

DENTAL ECONOMICS.

DR. CHARLES R. E. KOCH.

SENIOR—FINAL.

March 25, 1907.

1. Define dental economics.
2. Where does the dentist obtain his capital and how does he extend it?

3. What social quality should a dentist practice to obtain the highest economic results?
4. Is cleanliness of office, instruments and person essential? If so, why?
5. Does the dentist occupy different relations, from the business point of view, toward his patients from those of the merchant or manufacturer toward his customers? Why?
6. Having established yourself, what quality should you cultivate to assure success?
7. Is care in the treatment of children essential, and why?
8. What should be the basis for the fixing of your fees?
9. Is it proper to charge one person more than another for the same class of service?
10. Will you keep records of operations and financial transactions? If so, give three reasons.
11. At what time would you make such record, and why?
12. Give economic reasons for the purchase of insurance against fire.
13. Also about life insurance.
14. Is a dentist ever justified in advertising his business? If so, how and when?
15. For economic reasons what precaution should you take in the administration of anesthetics?
16. What should you observe regarding the length of sittings given your patients?
17. How long will you guarantee your operation to endure?
18. Knowing an operation fails through your own fault, what is your duty in reference to it?
19. After you are established in practice, what should you do in order to keep abreast with the progress of your profession?
20. State some of the obligations of the dentist (1) due to his patient, (2) to his brother practitioner, and (3) to himself.

TEXT-BOOKS

are on sale in the Theodore Menges Library of the school at publishers' prices. There will be a small profit from the sale of these books, which will be used for the benefit of the school or library. Students are invited to purchase their books in the school.

FIRST YEAR.

Anatomy—Cunningham. $6.00 Cloth. $7.00 Sheep.
Dental Anatomy—Black. $2.50.
Technical Procedures in Filling Teeth—Black. $2.00.
Prosthetic Dentistry—Prothero. $5.00.
Physiology—Kirkes. $3.00.
Chemistry—Hall, Remsen. $1.00 and 80c.
Histology—Bailey. $3.00.
Medical Dictionary—Duane, Gould, Thomas. $3.00; $1.00.

SECOND YEAR.

Anatomy—(Same as first year.)
Technical Procedures in Filling Teeth—Black.
Prosthetic Dentistry—Prothero.
Physiology—Kirkes. (Same as first year.)
Materia Medica—Hare, MaWhinney. $4.00; $5.00.
Chemistry—Hall, Remsen. $1.00; 80c.
Comparative Anatomy—Thompson. $1.50.
Histology—Bailey, Noyes.

THIRD YEAR.

Technical Procedures in Filling Teeth—Black.
Operative Dentistry—Black. $2.50.
Prosthetic Dentistry—Prothero.
Oral Surgery—Gilmer, Marshall. $2.00; $5.50.
Orthodontia—Angle, Guilford, second edition. $3.00; $2.25.
Special Materia Medica—Hare, MaWhinney.
Dental Jurisprudence—Rehfuss.
Micro-Organisms—Black, Abbott.

REFERENCE BOOKS.

American System of Dentistry.
Crown and Bridge Work—Evans.
Diseases and Injury of the Teeth—Smale and Colyer.
Principles of Surgery—Senn.
The American Text-Book of Prosthetic Dentistry—Essig
The American Text-Book of Operative Dentistry—Kirk.
Micro-Organisms of the Human Mouth—Miller.
Micro-Organisms—McFarland.
Dental Pathology and Pharmacology—Burchard.
Oral Surgery—Garretson.
Long's Chemistry.
Comparative Dental Anatomy—Tomes, Thompson.
Regional Anatomy of the Head and Neck—Eckley.
Anatomy—Morris, Eckley.
Histology—Piersol.

SUMMARY OF STUDIES.

FIRST YEAR.

Anatomy, two recitations or lectures per week during term.
Anatomy, dissecting half of the median half of the human body.
Physiology, to Nervous System, two lectures per week.
Histology, one lecture per week.
Histology, laboratory, two hours per week.
Inorganic Chemistry, lectures and laboratory, three hours per week.
Dental Anatomy, first semester, three half days per week.
Operative Technics, three half days per week.
Prosthetic Technics, three half days per week.
Prosthetic Dentistry and Metallography, one lecture per week.
Quiz and study hours.

SECOND YEAR.

Anatomy, two recitations or lectures per week during term.
Anatomy, dissecting half of the median half of the human body.
Comparative Dental Anatomy, one hour per week.
Physiology, Nervous System, one lecture per week.
General Materia Medica and Therapeutics, one lecture per week.
Pathology, general, one lecture per week.
Inorganic Chemistry, lectures and laboratory, three hours per week.
Organic Chemistry, one lecture and three hours' laboratory work per week in second semester.
Histology, general and dental, one lecture per week.

Histology, laboratory, two hours per week.
Prosthetic Dentistry, two lectures per week.
Operative Dentistry, two lectures per week.
Prosthetic Dentistry, laboratory and infirmary practice.
Operative Dentistry, technics and infirmary practice.
Quiz and study hours.

THIRD YEAR.

Dental Pathology, two lectures per week.
Oral Surgery, one lecture per week.
Oral Surgery Clinics, two hours per week.
Oral Surgery, quiz, one hour per week.
Orthodontia, one lecture per week.
Orthodontia Clinics, three hours per week.
Dental Jurisprudence and Ethics, about ten lectures.
Dental Economics, about twelve lectures.
Prosthetic Dentistry, one lecture per week.
Prosthetic Dentistry, laboratory and infirmary practice.
Bacteriology, one lecture per week, first semester.

WRITTEN QUIZZES AND EXAMINATIONS

Are held by the various professors at intervals during the course, and especially at the end of the first semester. A few of these latter, especially in those lecture courses which terminate with the first semester, are final examinations and a few others are final upon the subjects passed over. But, for the most part, they take form of written quizzes, as an educational exercise and for determining the progress being made by the classes as a whole, and by the individual student. Past experience has shown that the written quiz is of great value to the student as a training in the formation of his ideas and in pointing out the particular lines of his strength or weakness and guilding him in his further studies.

The monthly reports of attendance, and the standing of pupils in quizzes, recitations, laboratory work and in infirmary practice, both operative and prosthetic, are considered in making up the rating upon final examinations.

The final examinations are held at the close of the term.

The special announcements of the several depart[illegible] versity may be had on application addressed as follows:

College of Liberal Arts,
The Registrar, University Hall, Evanston, Ill.

Medical School,
The Secretary, 2421 Dearborn Street, Chicago, Ill.

Law School,
The Secretary, Northwestern University Building, Chicago.

School of Pharmacy,
The Secretary, Northwestern University Building, Chicago.

The Dental School,
The Secretary, Northwestern University Building, Chicago.

School of Music,
The Secretary, Music Hall, Evanston, Ill.

For information concerning the non-degree-conferring departments, address,

The Academy, Evanston, Ill.
Professor Arthur H. Wilde, Ph.D., Acting Principal.

Grand Prairie Seminary, Onarga, Ill.
Reverend Henry Hoag Frost, A.B., President.

Elgin Academy, Elgin, Ill.
Mr. George E. Sleight, A.B., Principal.

For information concerning the Theological Schools, address as follows:

Garrett Biblical Institute,
Reverend Charles J. Little, LL.D., President.

Norwegian-Danish Seminary,
Reverend Nels E. Simonsen, D.D., Principal.

Swedish Theological School,
Reverend Albert Ericson, D.D., President.

For information concerning the *School of Oratory,* address Professor Robert L. Cumnock, L.H.D., Director, Evanston, Ill.

The Interstate School of Correspondence is located in the Studebaker Building, 378-388 Wabash Avenue, Chicago.

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